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ABSTRACT

This study involves the collaboration of researchers with 24 teachers in a 3-year intervention study aimed at investigating and improving vocabulary knowledge and reading comprehension of fourth and fifth grade students for whom English is a second language. Cross-sectional and longitudinal data were collected on various aspects of vocabulary knowledge and reading comprehension of English language learners and English-only peers. In year one, the vocabulary knowledge of all students was tested, and a large gap between the English language learners and English-only students was discovered. A set of lessons was subsequently developed that was hoped would reduce the gap between the groups. In year two, the lessons (20-40 minutes long, offered 4 days a week for 12 to 15 weeks) were given to fourth graders at sites in three states. It was found that after 12 weeks of supplemental instruction the breadth of vocabulary knowledge was measurably improved, but reading comprehension was not noticeably improved. In year three, the intervention was again administered to the same students, now in fifth grade, and to a new group of fifth graders. Students receiving this extra instruction outperformed comparable students on measures of breadth and depth of vocabulary knowledge and reading comprehension. Students who received both years of instruction had a measurable boost in vocabulary knowledge, but not a significant difference in reading comprehension from those receiving only one year. Overall, English language learners in 2 years closed the gap with native speakers by about 50 percent--from about one to 0.5 standard deviations. It was concluded, therefore, that the extra instruction was quite effective. Extensive references and tables of quantitative data are included. (Contains 19 references.) (KFT)

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Vocabulary Improvement and Reading in English-Language Learners : An Intervention Study

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Running head: INTERVENTION

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Abstract

This study involves the collaboration of researchers with 24 teachers in an intervention study aimed at investigating and improving the vocabulary knowledge and reading comprehension of fourth- and fifth-grade students for whom English is a second language (English-language learners). Cross-sectional and longitudinal data were collected on various aspects of vocabulary knowledge and reading comprehension of English-language learners and English-only peers. Researchers and teachers collaborated in developing and implementing intervention strategies directed at improving vocabulary knowledge and reading comprehension in English-language learners.

In the first year of the project (Study 1) we examined the vocabulary knowledge of English-language learners and English-only students at the fourth- and fifth-grade levels. The findings indicated a large gap between the groups across all aspects of vocabulary knowledge. We then developed, with the help of participating teachers, an set of lessons we hoped would increase vocabulary knowledge in English-language learners.

In the second and third years of the project (Study 2) we implemented the intervention at sites in California, Virginia, and Massachusetts. The set of lessons involved from 20-40 minute lessons, typically offered four days a week over 12 to 15 weeks, of semi-scripted instruction and exercises designed to improve various

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aspects of vocabulary knowledge. After 12 weeks implementation with fourth graders, we found their breadth of vocabulary knowledge improved, especially among English-language learners. However, there were no noticeable gains in other aspects of vocabulary knowledge or in reading comprehension in the students in the intervention as compared to similar students in the same school.

In the third year of the study we administered the intervention to some fifth -grade students who had received it in the fourth grade and to a new group of fifth graders. At the end of the year we found that students in the program outperformed comparable students on measures of breadth and depth of vocabulary knowledge and on measures of reading comprehension. For students who were in the program for two years, the additional year had a significant impact on vocabulary knowledge but did not produce a statistically significant effect on reading comprehension. English-language learners in the program closed the gap between themselves and native speakers by about 50 percent, from about one standard deviation on measures of vocabulary knowledge and reading comprehension to .5 standard deviations. We concluded that an enriched vocabulary program carried out over a number of years can substantially close the gap between native and non-native speakers in vocabulary knowledge and reading comprehension.

Vocabulary Improvement and Reading in English-Language Learners :

An Intervention Study

American education is at a crossroads in some ways similar to that faced in the early part of the 20th century. Then, as now, schools in some areas of the country encountered large numbers of students from immigrant families who were not fluent in English. Although in the past some of those students succeeded academically, even graduating from college, most left school without a high school diploma, and many never learned to speak, read, or write English well. Nevertheless, many were able to pursue a decent livelihood, even without adequate English skills.

The situation for non-English speakers (English-language learners) is significantly different today. As the U.S. economy has shifted from an industrial base to one requiring workers to possess technological and analytical skills, schools are being asked to prepare all students to read and write at a sophisticated level, to think critically and to apply their knowledge to solving real-world problems. A much higher level of English fluency and literacy is now essential.

English-language learners constitute a particularly high risk group. A Congressionally-mandated study indicates that these students receive lower grades, are judged by their teachers to have lower academic abilities, and score below their classmates on standardized tests of reading and mathematics (Moss & Puma,

1995). These findings underscore the importance of research on second-language learning. The dimensions of the problem are enormous in this country where it is estimated that 4.5 million children come to school from families where the home language is other than English. Such children often do not possess the English language skills sufficient to allow them to participate fully in the all-English core curriculum classes. The thesis of this study is that many English-language learners do poorly because they are not reading at the level necessary for school success. Despite excellent programs and devoted teachers, many students for whom English is a second language (English-language learners) have difficulty succeeding in American schools. The ability to read at age- and grade-appropriate levels is particularly critical to school success.

Research Background

The research literature suggests that--contrary to conventional wisdom--second-language learning is not easy and automatic for children (McLaughlin, 1993). Acquiring a second language requires a great deal of trial-and-error, creative hypothesis-testing, and awkward experimentation. Especially in the classroom context, second-language learning is a difficult and frustrating enterprise for many children. Learning to read in a second language is especially important. For many English-language learners, problems with reading are the beginning of school failure. The late elementary grades are especially critical. At this point

children have to learn to read in units larger than individual words(Gibson & Levin, 1975). More cognitive elaboration is required as the text is less contextualized than in earlier grades. This happens at the time that many children who have been in bilingual programs are exited to the all-English classroom.

Vocabulary knowledge is especially important in this process. Studies have shown that a strong relationship exists between knowledge of word meaning and ability to comprehend passages containing those words (Anderson & Nagy, 1992). Vocabulary knowledge is very highly correlated with scores on general intelligence scores, standardized achievement tests, and school success (Dickinson, 1984). Furthermore, some measure of vocabulary difficulty is always a major component of readability formulas used to grade the difficulty of textbooks. The more difficult the words of a passage are, the more difficulty the reader will have in making sense of the text.

Little systematic research has been conducted on reading comprehension in English-language learners. Even less is known about the best predictor of reading comprehension--vocabulary knowledge. There is some research with English-language learners that suggests that vocabulary knowledge is a crucial factor for school success. A study of Latino and Cantonese grade-school children (Ammon, 1987) indicated that unknown vocabulary on tests was a critical linguistic factor adversely affecting reading test performance. In another study, oral vocabulary

production was a very strong correlate--and the only oral proficiency correlate--of English reading achievement (Saville-Troike, 1984). Indeed, vocabulary knowledge has been found to be even more important for test performance among fifth-and sixth-grade Latino students than was prior knowledge of content (Garcia, 1991).

Conceptual Framework

The goal of this study is to look at the effect of a vocabulary enrichment program on the reading ability of English-language learners. Traditionally, research on vocabulary knowledge has been concerned solely with the number of words in the child's lexicon--i.e., the breadth of vocabulary knowledge. It is important as well to look at the depth of the child's knowledge--i.e., how well does the child know the words in the lexicon. Thus, in addition to examining the child's breadth of vocabulary knowledge, we looked at the child's understanding of different aspects of depth of vocabulary. For example, many words in the English language possess multiple dictionary definitions. For example, the word "light" can mean not heavy or a source of illumination or something necessary to smoke a cigarette (as in "Do you have a light?"). This aspect of depth adds considerable cognitive complexity to the process of vocabulary acquisition.

Even words with an apparently unambiguous meaning express different aspects of meaning. Barclay, Bransford, Franks, McCarrell, & Nitsch (1974) gave

the example of the word 'piano':

The man lifted the piano.

The man tuned the piano.

The man smashed the piano.

The man sat on the piano.

The man photographed the piano.

In these different contexts, various meaning aspects of the word 'piano' are emphasized: 'is heavy,' 'musical,' 'made largely of wood,' 'has a flat surface perpendicular to gravitational pull,' and 'has a characteristic shape.'

In one of the few studies of vocabulary depth, Verhallen and Schoonen (1993) showed that the vocabulary delay of bilingual children was not confined to the number of words in the target language. Children from immigrant families in the Netherlands lagged behind native speaking peers in both number and range of meaning aspects. We use methods similar to those used in that study to explore English-language learners' understandings of the conceptual properties of vocabulary items, as well as other methods to study the students' understanding of polysemy--the multiple meanings of words. Our intervention aimed at improving both of these aspects of vocabulary depth-- in addition to improving students' breadth of vocabulary.

The present article reports on two studies. In the first study we examined

the difference between English-language learners and native English speaking students at the fourth- and fifth-grade levels in schools in different parts of the country with large Latino populations. The purpose of this study was to determine how great a gap existed between native and non-native speakers in vocabulary knowledge and reading ability. The second study describes a vocabulary-enrichment set of lessons we developed to improve the vocabulary knowledge and reading comprehension of English-language learners.

Study 1

The present project began in 1997 and examined the relationship between breadth and depth of vocabulary and reading ability in monolingual native English speakers and in English-language learners from Spanish-speaking backgrounds in fourth and fifth grade classes in California, Massachusetts, and Virginia. We were interested in the way in which these aspects of vocabulary knowledge changed over time and so we tested the children at the beginning and end of the school year.

Methods

Participants. The participants were 317 students in 24 fourth- and fifth-grade classrooms in three states. Of these, 208 were English-only students and 109 were English-language learners. All of the English-language learners were Spanish speaking. In California, the children were from middle-class backgrounds and the

Spanish speakers were from families of Mexican descent. The schools used a variety of bilingual approaches. In Massachusetts, the Spanish-speaking children were from working-class families of Puerto Rican descent. Instruction for these children was primarily in English. During the final two years of the study, the school in Massachusetts participated in a Success for All program. In Virginia, the EO children were from middle-class backgrounds and the Spanish speakers were from working-class families from various Central American countries.

The testing took place in October of 1997 and May of 1998. Because of various scheduling difficulties, not all students took all tests.

Assessment materials and procedures. Participants were tested individually on the L form (pretest) and M form (posttest) of the Peabody Picture Vocabulary Test Revised (PPVT-R). This test is a measure of receptive vocabulary in which children had to select the picture (of four) considered to best illustrate the meaning of stimulus words presented orally.

To measure productive vocabulary we used a naming task in which students were presented with a picture of a kitchen setting and a classroom setting on which individual items were numbered. The students were to write the name of the numbered items for both pictures in the corresponding spaces. The student's score on the Naming Task was the total number of correct items (regardless of spelling) across both pictures. The identical version of the Naming Task was given

at the beginning and end of the year to all children.

The polysemy comprehension task consisted of 26 English sentences, ten of which were distractors not included in the analysis. The remaining 16 sentences contained two polysemous verbs, stand and grow. These verbs were chosen because of their range of meanings. The participants were to indicate whether the sentences sounded correct or incorrect in English. The student's score on this task was the number of correct decisions across both well-formed and ill-formed instances. This task was also administer in the beginning and at the end of the school year.

We also administered a polysemy production task in which the student's task was to generate as many sentences as possible with different meanings for the following words-- "bug," "light," "ring,"and "hand." This task was administered once and scores consisted in the number of novel meanings the student could think of.

The reading task was the Sentence Verification Technique (SVT) (Royer, 1990). The SVT is based on the theoretical assumption that comprehension is a constructive process that results from the interaction between context, the reader prior knowledge, and the linguistic message (Royer, 1990). The interaction among these factors is believed to result in the construction of a memory representation that preserves the meaning but not necessarily the surface form of a linguistic

message. An examinee takes an SVT test by reading a short passage which is usually twelve sentences long. After having read the passage the examinee is presented with a series of test sentences which are of four types. An Original sentence is an exact replica of a sentence that appeared in the passage. A Paraphrase sentence preserves the meaning of a sentence in the passage but expresses this meaning through a different choice of words. A Meaning Change sentence is almost identical to a sentence in the original passage, but has had one or two words changed in a manner that alters the meaning from that expressed in the passage. Finally, a Distractor sentence is consistent with the overall theme of the passage but never appeared in the passage. Examinees are asked to answer 'yes' if the test sentence means the same as a sentence in the story (originals and paraphrase sentences) and to answer 'no' if it has a different meaning from a sentence in the story (meaning change and distractor sentences).

Results

Vocabulary measures. Table 1 shows the mean PPVT(R) scores at the beginning and end of the year for English-only (EO) children and English-language learners (ELLs). The difference between the groups is significant at both the beginning, $t(353) = 15.97$, $p < .001$, and end of the year, $t(151) = 12.23$, $p < .001$. Both groups showed significant gains over the course of the year: for EO children, $t(82) = 3.80$, $p < .001$; for ELLs, $t(63) = 2.12$, $p < .05$. When we

examined the amount gained per participant over the year on the PPVT, there was no significant difference in amount gained between the two groups (M for EO children = 3.88; M for ELLs = 3.44).

On the naming task (Table 2), there was a significant difference between EO children and ELLs in both the beginning, t (347) = 14.16, p < .001, and end of the year, t (77) = 10.63, p < .001. Both groups showed significant increases: for EO children, t (40) = 2.06, p < .05, and for ELLs, t (29) = 2.30, p = .05. As with the PPVT, the comparison of individual gain scores showed no significant difference: (M for EO children = 1.54; M for ELLs = 1.50).

For the polysemy comprehension task (Table 3), there was a significant difference on this task between EO children and ELLs in both the beginning, t (344) = 8.76, p < .001, and end of the year, t (77) = 5.71, p < .001. Both groups showed slight, but non-significant increases: for EO children, t (41) = .54, p > .05, and for ELLs, t (29) = .41, p > .05. Comparison of individual gain scores showed no significant difference: (M for EO children = .12; M for ELLs = .20).

On the polysemy production task the differences between groups were once again considerable. The M for EO children on this task was 10.02 and for ELLs 4.02. These differences were statistically significant (t (208) = 8.87, p < .001).

Because we were interested in whether the magnitude of the differences

between EO children and ELLs was different for the three tests, we examined the effect size for these differences for the PPVT, naming, and polysemy measures using the point biserial r as the measure of effect size (Welkowitz, Ewan, & Cowen, 1991). The effect size for the differences for the PPVT test was .65 in the beginning of the school year and .71 at the end. The corresponding values for the naming task were .61 and .77, and for the polysemy comprehension task they were .42 and .55. For the polysemy production task the effect size was .52.

In order to eliminate possible effects of parental education level, we repeated the analyses of the differences between EO children and ELLs on these three tasks at both the beginning and end of the school year using an analysis of covariance design with parental education level as the covariate. The differences between the means were slightly attenuated, but the significant differences in favor of the EO children remained. As similar analysis using the Raven test (a non-verbal test of intelligence) as a covariate also showed some slight attenuation, but still a substantial difference ($p < .001$) in favor of EO children on all measures.

Reading comprehension. A similar picture emerged from analysis of the reading measure. This test was administered only once, so there were no analyses of change scores. Once again there were large differences between the groups in favor of EO children: M for EO children = 38.51, M for ELLs = 31.68; $t(335) = 9.60$, $p < .001$. The effect size was .46.

We also conducted separate analyses of the intercorrelations between our measures for EO children and ELLs (Table 4). As can be seen from the table, the correlations were higher for ELLs than for EO students. R^2 was .60 for ELLs and only .24 for EO students. The standard deviations were similar for each group (for EO children 6.03 and for ELLs 6.74), which indicates that the EO children were not reaching ceiling levels of performance. This suggests that at this stage, vocabulary knowledge is more important for English-language learners in achieving success in reading than it is for English-only students (who presumably are using world knowledge and other inferential skills in their reading at this point).

Summary. The findings for Study 1 are consistent with those of others who have reported similar differences between the vocabulary knowledge of English-only children and English-language learners (Umbel & Oller, 1994; Umbel & Pearson, 1992). This is not surprising in view of the differences in exposure to the language and in opportunities of use. However, our findings also indicate that the vocabulary gap remains constant over the course of a year. English-language learners are learning more vocabulary, but so are English-only children.

Study 2 describes our efforts to provide English-language learners with an enriched vocabulary program. Our intent was to provide direct instruction in key vocabulary. We hoped that vocabulary enrichment would produce concomitant

improvement in reading comprehension. Because of the nature of most of our classes, which were mixed groups of English-only students and English-language learners, we also included the former group of students in the intervention. In addition, we assessed other classes from the same schools as a control group.

Study 2

Study 2 was carried out between 1997-1999 in the same schools in California, Virginia, and Massachusetts as in Study 1. The intervention program is based on a conceptual framework that sees vocabulary development as involving multiple tasks. In particular, the learner has to acquire knowledge of the concepts the word represents, knowledge of the associations a word evokes, knowledge of the word's connotations, knowledge of the word's collocations, knowledge of the word's social and stylistic constraints, knowledge of the word's derivational possibilities, knowledge of the word's syntactic behavior, and knowledge of the multiple meanings of the word.

We see vocabulary development as a lifetime project. All speakers of the English language are constantly expanding and deepening their understanding of words in the English language. In accord with our view that words are best learned from rich semantic contexts, we selected target words from brief, engaging reading passages. In the course of this set of lessons we focus on a relatively small number of vocabulary items (12 a week, chosen as words that children of this age

are learning), but our hope was that the strategies that students learn generalize to their contact with other words. We believe that children need to learn the definitions of words, but also have to learn strategies for inferring meanings from context. They should be taught roots, affixes, and cognates, but they also need to develop strategies for monitoring their own understanding as they read texts.

We encouraged teachers to incorporate vocabulary learning into all subject matter instruction, so that children see that the strategies they learn --looking up definitions, inferring meaning from context, and monitoring their understanding -- apply in all areas of learning. We developed activities that fostered word play and creativity with words. There were homework assignments in which students noted uses of target words outside of class (at home, on TV, with friends) and posted the words and its context in class.

The aim is to develop a deep understanding of the target vocabulary. By this we mean having students make semantic links to other words and concepts so as to attain a deeper and richer understanding of a word's meaning. We encouraged teachers to help students see how new words are related to other words and to familiar experiences in their lives.

During the first year of the intervention, there was an initial five-week pilot of the materials. Based on observations and debriefings with teachers, we revised the materials into two six-week segments. The sixth week of each segments was a

review of all the words learned in the previous five weeks using new activities. The 12 core words targeted each week were words that students at this level are likely to encounter repeatedly across texts in different domains. The text we used was Arnold Lobel's book of classic fables published by Scholastic.

During the second year of the intervention, there were three five-week units with the fifth week of each segment a review. The curriculum used for the set of lessons during this year had the theme of immigration. Reading materials from which the words were drawn included first- and third-person narratives, diaries, text book accounts, and newspaper stories. The core target vocabulary was chosen as before--words that students would be in the process of learning and that were important across different disciplines. We made a number of changes in the activities for this year, discarding those that were confusing to students and teachers and adding new activities. In general, we felt that this year's materials were more challenging and at a higher level, as well as better designed, than the previous year's.

Table 5 lists some of the activities we used in the intervention. These activities were drawn from literature on vocabulary acquisition (e.g., Beck, McKeown, & Omanson, 1987) and from teacher suggestions. Teachers were asked to devote from 20 minutes to a half hour each day for these activities. Our observations and teacher reports indicated considerable variability in the amount of

time the teachers spent--in some cases, the minimum to cover the material and in other cases teachers often went beyond a half hour.

Methods

Participants. We had hoped that we would be able to continue students in our program for two years, but it proved difficult for principals at our schools to accommodate us in this respect. Student class assignments depend on a number of factors--availability of teachers, parent wishes, schedules of students--which were out of our control. Moreover, in California the passage of Proposition 227, which made bilingual education illegal, led to massive classroom reassignments. In one case, we were forced to change schools to obtain enough non-native speakers students for the intervention aspect of the study.

Assessment materials and procedures. In the beginning of the school year and at the end of the year students in the intervention and control groups were administered a test of their knowledge of the target words for that year, the PPVT as a test of breadth of vocabulary knowledge, and a test of their ability to produce multiple meanings of words (polysemy production) as a test of width of vocabulary knowledge. In addition, in the second year of the intervention, we added a test of morphology in which students had to demonstrate knowledge of word families by changing the ending of a given word to properly fit in a given sentence. For example, given the word, "farmer," the student had to fill in the

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sentence, "My uncle had a _____." We also added a test of depth of knowledge that measured the student's knowledge of the semantic associations of specific words. In this task, students drew lines to connect associated words. For example, given the word "dog," the students had to make the connection to three out of six possible associated words--"German," "tail," "box," "barks," "angel," and "paw." We used a cloze test as a measure of reading comprehension in both years.

Results

To analyze the effect of the intervention, we used gain scores from the fall to the spring assessment as the dependent variable. In all cases, there were no initial significant differences between the intervention and the control groups.

Vocabulary measures. After one year in the intervention, there were few significant differences between intervention and control groups. The one exception was the gain on the test of knowledge of target words from fall to spring ($t(192) = 4.73$, $p < .001$; effect size is .32). However, there was no significant gain on the PPVT ($t(195) = .73$, $p > .05$) or on the polysemy production test ($t(214) = 1.39$, $p > .05$).

At the end of the second year of the intervention, there was a significant gain on the test of knowledge of target words for the intervention as compared to the control groups ($t(242) = 11.09$, $p < .001$; effect size .58). The difference in gain on the PPVT was not significant ($t(224) = .57$, $p > .05$). However, the

polysemy production test showed differential gain favoring the intervention group (t (236) = 3.50, p < .001; effect size .22). The intervention group also showed a significantly greater gain on the test of morphology than did the control group (t (247) = 2.88, p < .01; effect size .18), as well as greater gains on the test of semantic associations (t (240) = 3.73, p < .001; effect size .23).

We then compared the gains of students who had been in the intervention for two years with those who were in it for only one year. On all measures except the test of morphology, those in the program for two years scored higher than those in the program for only one year. The differences were statistically significant for the test of semantic associations (t (158) = 2.82, p < .005; effect size .22). When we combined scores on all measures using standard scores, there was a marginally significant effect accruing from an additional year in the program (t (136) = 1.94, p = .05; effect size .16).

Table 6 shows the gains achieved by EO children, ELLs, and control groups on our assessments. EO children who received the intervention significantly outperformed EO controls on the test of knowledge of target words (t (108) = 8.42, p < .001; effect size .63) and on the test of semantic associations (t (107) = 2.60, p = .01; effect size .24). ELLs who received the intervention significantly outperformed ELL controls on the test of knowledge of target words (t (126) = 7.24, p < .001; effect size .54), on the polysemy production task (t (125)

= 3.95, $p < .001$; effect size .33), on the morphology task ($t(128) = 2.50$, $p < .02$; effect size .22), and on the test of semantic associations ($t(127) = 2.44$, $p < .02$; effect size .21).

Table 6 also shows differences between ELLs and EO children resulting from an additional year of intervention. Combining all scores using standard scores indicated that there was a significant advantages from an additional year for EO children ($t(61) = 2.31$, $p < .05$; effect size .28). For ELLs there was also an advantage, but the differences were not statistically significant.

Reading comprehension. After one year in the intervention there were no differences between those students who had received the intervention and those who had not on our measure of reading comprehension (a cloze test). After two years, however, there were significant differences in favor of the intervention students ($t(235) = 3.81$, $p < .001$; effect size .24). However, when we compared students who had been in the program for one year and with those in the intervention for two years, there were no statistically significant differences.

Table 7 shows the gains achieved by EO children, ELLs, and control groups on the measure of reading comprehension. EO children who received the intervention showed significantly greater gains than did control children ($t(106) = 2.43$, $p < .02$; effect size .23). This was also the case for ELLs ($t(123) = 3.14$, $p < .01$; effect size .27). The differences between these groups as a result of an

additional year in the intervention were not statistically reliable.

Closing the gap. Did our intervention help to close the gap between EO children and ELLs? In Study 1 with fourth- and fifth-grade students, the gap between EO children and ELLs averaged 1.38 standard deviations on the vocabulary measures when all the measures were combined using standard scores. The gap on the reading comprehension test was .96 standard deviations. After one year of the intervention, the gap was 1.07 standard deviations between fourth-grade EO children and ELLs on the vocabulary measures and 1.06 standard deviations on reading comprehension. When we compared EO control students and ELLs in the intervention to determine the effect of the treatment in closing the gap, the differences remained about the same: 1.08 on the vocabulary measures and .97 on reading comprehension.

After the second year of the intervention, the gap was .87 standard deviations between fifth-grade EO children and ELLs on the vocabulary measures and .91 standard deviations on reading comprehension. When we compared EO control students and ELLs in the intervention to determine the effect of the treatment in closing the gap, the differences were attenuated: .55 standard deviations on the vocabulary measures and .50 deviations on reading comprehension. This compares to a difference of .98 standard deviations for vocabulary measures and 1.18 for reading comprehension when the ELLs in the

control group are compared to EO controls.

Another way to answer this question is to compare the differences in gain scores between ELLs who were in the intervention and ELLs who were not with those of EO control students. That is, we wanted to see if ELLs who received the intervention gained more relative to EO control students than did ELLs who did not receive the intervention.

At the end of year one of the intervention, there were no differences in gain scores between ELLs who did not receive the intervention and EO controls. That is, EO students maintained their advantage over these ELLs. ELLs who did receive the intervention showed some greater gains than EO controls, but these differences did not attain statistical significance. Thus the gap between the groups remained after a year of the intervention.

At the end of the second year of the intervention, ELLs in the control group did not differ in their gains compared to EO control students. However, ELLs who received the intervention showed significantly larger gains than did EO controls on the test of knowledge of target words (t (121) = 7.91, $p < .001$; effect size .58), on the polysemy production task (t (119) = 3.37, $p < .001$; effect size .30), on the morphology task (t (121) = 2.02, $p < .05$; effect size .18), and on the test of cloze test (t (118) = 1.98, $p = .05$; effect size .18). The differences on the test of semantic associations also favored the ELLs in the intervention, though

these differences were only marginally significant (t (120) = 1.81, p = .07; effect size .16). These findings provide further evidence that ELLs who received the intervention were closing the gap between themselves and EO students.

Discussion

The goal of this research project was to examine the effect of a vocabulary enrichment program on the reading ability of English-language learners. We began in Study 1 by examining differences between fourth- and fifth-grade native and non-native speakers in vocabulary knowledge and reading ability. Study 2 examined the effect of a vocabulary-enrichment set of lessons we developed to improve the vocabulary knowledge and reading comprehension of English-language learners at these grade levels.

In Study 1 we found a large gap of about a standard deviation between scores on vocabulary measures and reading comprehension between native EO children and ELLs. An examination of the intercorrelations between variables indicated that ELLs are relying more on their vocabulary knowledge than are EO students when reading text. Presumably natives speakers are more dependent on background knowledge and other inferential skills at this point in their reading. This finding underscores the importance of vocabulary knowledge for children who are not native speakers of English.

The set of lessons we developed used a variety of strategies to make

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children aware of vocabulary and to help them infer meanings of words they are not familiar with. The findings from the first and second year of the intervention indicated that the children receiving the intervention learned the target vocabulary items better than did control children. However, there were no other gains for children in the intervention after one year. Moreover, the scores of ELLs in vocabulary knowledge and reading comprehension remained about a standard deviation lower than those of EO children.

However, this changed after the second year of the intervention. The effects of the intervention were more marked after this year. This was true for both the EO children and ELLs, when compared to similar control students. Most of the vocabulary measures and the reading comprehension measure indicated improvement as a result of the intervention. Furthermore, the intervention had the effect of closing the gap between EO students and ELLs by about half a standard deviations for both vocabulary and reading comprehension measures.

These findings are consistent with the work of the Dutch researchers Appel and Vermeer (1996) who employed a similar intervention of two to four hours of Dutch vocabulary instruction within and outside of the classroom with non-native Dutch children. After four years in the program, children showed gains of one or two years in vocabulary development when compared to their age peers of the same ethnic background. There were also marked gains in reading comprehension.

These researchers concluded that ethnic minority children can catch up to native speakers in vocabulary knowledge if they receive targeted vocabulary instruction for about four hours a week throughout the school year and if the instruction is carried out for all eight grades of primary school.

Our research also suggests that a year of intervention is not enough. Generally speaking, our data indicate that those children who were in the program for two years outperformed children in the program for only a year--although there was only a trend in this direction on the vocabulary measures for ELLs and no differences were found on the reading comprehension measure.

There is also the possibility that the advantage found in the second year of the intervention accrued from the changes we made between the first and second years. At this point we had added new activities and removed some that were not well understood by teachers and students. We had more literary genres and the activities were more enjoyable to the students. Moreover, there were new teachers in the second year of the intervention, and they might have been more involved with the materials.

Whatever the reason, the results after two years were more positive than those we found after one year. Our findings suggest that gains can be made by non-native speakers in vocabulary development and reading comprehension over time if they receive an enriched program of vocabulary instruction. Ideally, such a

program would be in place throughout the years of primary schooling.

Finally, it should be noted that we achieved these results in spite of considerable variability in fidelity of implementation. There was variability in teacher motivation and engagement, in time devoted to the lessons, in student absences. School-wide testing often made investing enough time in these lessons difficult. Nonetheless, in spite of differences in implementation, a set of activities that focused on vocabulary enrichment led to improvements in vocabulary knowledge and reading comprehension, especially for English-language learners. We are currently examining the data to compare the effects achieved as a function of quality of implementation.

References

Appel, R.; Vermeer, A. (1996). Speeding up the acquisition of Dutch vocabulary by migrant children. Uitbreiding van de Nederlandse woordenschat van allochtone leerlingen in het basisonderwijs. Pedagogische Studieen, 73, 82-92.

Ammon, M. S. (1987). Patterns of performance among bilingual children who score low in reading. In S. R. Goldman & H. T. Trueba (Eds.), Becoming literate in English as a second language. Norwood, NJ: Ablex.

Anderson, J. C. & Nagy, W. E. (1992). The vocabulary conundrum. American Educator, 14-16, 44-48.

Barklay, J. R., Bransford, J. D., Franks, J. J., McCarrell, N. S., & Nitsch, K. (1974). Comprehension and semantic flexibility. Journal of Verbal Learning and Verbal Behavior, 13,471-481.

Beck, I., McKeown, M. G., & Omanson, R. C. (1987). The effects and uses of diverse vocabulary instructional techniques. In M. G. McKeown & M. E. Curtis (Eds.), The nature of vocabulary acquisition. (pp. 147-163). Hillsdale, NJ: Erlbaum.

Dickinson, D. (1984). First impressions: Children's knowledge of words gained from a single exposure. Applied Psycholinguistics, 5, 359-373.

Garcia, G. E. (1991). Factors influencing the English reading test performance of Spanish-speaking Hispanic students. Reading Research Quarterly,

26, 371-392.

Garcia, G. E. & Nagy, W. E. (1993). Latino students' concept of cognates. In D. J. Leu & C. K. Kinzer (Eds.), Examining central issues in literacy research, theory, and practice. Chicago: National Reading Conference.

Gibson, E., & Levin, H. (1975). The psychology of reading. Cambridge, MA: MIT Press.

McLaughlin, B. (1993). Myths and misconceptions about second language learning: What every teacher needs to unlearn. Santa Cruz, CA: National Center for Research on Cultural Diversity and Second Language Learning.

Moss, M. & Puma, M. (1995) Prospects: The Congressionally Mandated Study of Educational Growth and Opportunity. First Year Report on Language Minority and Limited English Proficient Students. Report prepared for the U.S. Department of Education. Cambridge, Mass: Abt Associates, Inc.

Royer, J. M. (1990). The Sentence Verification Technique: A new direction in the assessment of reading comprehension. In S. M. Legg and J. Algina (Eds.), Cognitive assessment of language and math outcomes (pp. 144-191). Norwood, N. J.: Ablex.

Saville-Troike, M. (1984). What really matters in second learning for academic achievement? TESOL Quarterly, 18, 199-219

Verhallen, M., & Schoonen, R. (1993). Vocabulary knowledge of

monolingual and bilingual children. Applied Linguistics, 14, 344-363.

Umbel, V. M., & Oller, D. K. (1994). Developmental changes in receptive vocabulary in Hispanic bilingual school children. Language Learning, 44, 221-242.

Umbel, V. M. Pearson, B. Z., Fernandez, M. C., & Oller, D. K. (1992). Measuring bilingual children's receptive vocabularies. Child Development,

Welkowitz, J., Ewen, R. B., & Cohen, J. (1991). Introductory statistics for the behavioral sciences. Fourth Ed. New York: Harcourt, Brace, and Jovanovich.

Table 1

Mean PPVT(R) Scores[a] at the Beginning and End of the Year for English-Only Children and English-Language Learners

	Beginning of Year	End of Year
E-O Children	(N = 225)	(N = 44)
M	116.05	122.59
SD	13.91	13.21
ELLs	(N = 130)	(N = 69)
M	84.76	86.59
SD	23.00	22.71

[a]Total possible score is 175.

Table 2

Mean Scores on the Naming Task at the Beginning and End of the Year for English-Only Children and English-Language Learners[a]

	Beginning of Year	End of Year[b]
E-O Children	(N = 219)	(N = 43)
M	28.12	29.09
SD	3.74	1.41
ELLs	(N = 130)	(N = 36)
M	19.70	20.22
SD	7.35	5.25

[a]Total possible score is 30.

[b]This test was administered only in California in the Spring.

Table 3

Mean Scores on the Polysemy Task at the Beginning and End of the Year for English-Only Children and English-Language Learners [a]

	Beginning of Year	End of Year[b]
E-O Children	(N = 220)	(N = 43)
M	14.66	15.05
SD	1.27	1.02
ELLs	(N = 126)	(N = 36)
M	13.05	12.64
SD	2.26	2.53

[a]Total possible score is 16.

[b]This test was administered only in California in the Spring.

Table 4

Correlations between Vocabulary and Reading Measures for English-Only Students and English Language Learners, Grades 4 and 5 Combined

English-Only Students (N= 208)				
	Peabody	Naming Task	Polysemy Comp.	Polysemy
Prod.Reading	.46	.13	.17	.31
Peabody		.29	.12	.37
Naming			.19	.13
Poly. Comp.				.11

English-Language Learners (N= 109)				
	Peabody	Naming Task	Polysemy Comp.	Polysemy
Prod.Reading	.48	.46	.30	.43
Peabody		.59	.47	.74
Naming			.51	.62
Poly. Comp.				.43

Table 5

Some Activities Used to Foster Vocabulary Growth

Charades: Students work in competing teams. They act out words for their team as in the charade game.

Word Substitutions: Students hear a word in a sentence and are asked to think about its meaning and replace it with another word or phrase that means the same thing.

Word Guess: Students work in teams and have to prompt team members to guess a target word by giving one-word clues.

Word Bee: Small groups generate definitions of target words for the whole class, which evaluates their adequacy.

20 Questions: One student chooses an animal from one of the fables and tells the teacher. The other students ask questions to identify the features of the animal until they have enough information to identify the animal.

Word Wizard: Students note uses of target words outside of class (at home, on TV, with friends) and post the words and its context in class.

Word Webs: The teacher writes the target vocabulary word in the center of the word web and asks the students to complete the empty web by providing the definition, synonyms, antonyms, other meanings, and new sentences using the word.

Multiple Meanings: Students are given a target word and are asked to provide as many meanings of the word they can come up with.

Cognates: Students write identify Spanish cognates in the passage and discuss the meaning of the word to insure it is the same in both languages.

Word Associations: The teacher displays the word list and gives either a one-word clue or a phrase related to one of the vocabulary words. Clue words are read one at a time until a student chooses the correct vocabulary word and can justify the answer.

Word Sort: Students are given a set of word cards and are asked to separate them into groups depending on characteristics of the words. They are asked to explain how each group is different and why each word fits into the group.

Idioms: Students are given a list of five idioms and are asked to discuss the meaning of each idiom and then write down a definition on their worksheet. They are also asked to write an additional sentence using the idiom.

Table 6

Gain Scores for English-Only Students and English-Language Learners on Vocabulary Assessment Measures at End of Second Year of Intervention

English-Only Students			
Measure	One Year in Intervention	Two Years in Intervention	Control Group
Curriculum-Dep.	8.82 (N=45)	8.07 (N=29)	1.31 (N=36)
PPVT	8.21 (N=42)	7.14 (N=29)	8.51 (N=35)
Polysemy Prod.	1.32 (N=44)	1.67 (N=27)	.54 (N=35)
Morphology	15.35 (N=43)	15.55(N=29)	10.97 (N=36)
Semantic Assoc.	3.18 (N=45)	10.50 (N=28)	2.19 (N=36)

English-Language Learners			
Measure	One Year in Intervention	Two Years in Intervention	Control Group

Curriculum-Dep.	7.89 (N=55)	10.66 (N=32)	2.29 (N=41)
PPVT	8.69 (N=52)	8.25 (N=28)	9.84 (N=39)
Polysemy Prod.	2.20 (N=54)	2.59 (N=32)	.61 (N=41)
Morphology	14.34 (N=55)	21.32 (N=32)	9.72 (N=43)
Semantic Assoc.	4.72 (N=54)	5.09 (N=32)	1.37 (N=43)

Table 7

Gain Scores for English-Only Students and English-Language Learners on Reading Comprehension at End of Second Year of Intervention

	One Year in Intervention	Two Years in Intervention	Control Group
English-Only Students (N=108)	1.95 (N=44)	2.75 (N=28)	1.08 (N=36)
English-Language Learners (N=125)	2.46 (N=52)	1.72 (N=32)	.37 (N=41)